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WPI ACC NO: 1989-194236/198927

XRAM Acc No: C1989-085856

XRPX Acc No: N1989-148554

**High gas impermeable multilayered packaging material - used for transparent  
packaging of food in containers for retorting**

Patent Assignee: KURARAY CO LTD (KURS)

Inventor: FUKUTOME S; MORITANI T; MORIYA T; MOTOISHI Y; ODA H

**Patent Family (14 patents, 11 countries)**

Patent	Application						Update
	Number	Kind	Date	Number	Kind	Date	
EP 322891	A	19890705	EP 1988121789	A	19881228	198927	B
DK 198807254	A	19890630				198936	E
AU 198827550	A	19890629				198939	E
JP 1253442	A	19891009	JP 1987335823	A	19871229	198946	E
			JP 198822580	A	19880201		
			JP 198922890	A	19890131		
JP 1308626	A	19891213	JP 1987335823	A	19871229	199005	E
			JP 198822580	A	19880201		
			JP 198922890	A	19890131		
US 4999229	A	19910312	US 1988291732	A	19881229	199113	E
US 5069946	A	19911203	US 1990631672	A	19901221	199151	E
JP 1993086918	B	19931214	JP 1988333785	A	19881227	199401	E
EP 322891	B1	19950412	EP 1988121789	A	19881228	199519	E
CA 1335424	C	19950502	CA 586890	A	19881222	199525	E
DE 3853578	G	19950518	DE 3853578	A	19881228	199525	E
			EP 1988121789	A	19881228		
DK 171446	B	19961104	DK 19887254	A	19881228	199650	E
JP 10080981	A	19980331	JP 198922890	A	19890131	199823	E
			JP 1997198896	A	19890131		
JP 2888515	B2	19990510	JP 198922890	A	19890131	199924	E
			JP 1997198896	A	19890131		

Priority Applications (no., kind, date): JP 1997198896 A 19890131; JP  
 198822580 A 19880201; JP 1987335823 A 19871229; JP 198922890 A  
 19890131

#### **Patent Details**

Number	Kind	Lan	Pg	Dwg	Filing Notes
EP 322891	A	EN	17	0	
					Regional Designated States,Original: BE DE FR GB IT NL SE
JP 1993086918	B	JA	12		Based on OPI patent JP 01253442
EP 322891	B1	EN	20	0	
					Regional Designated States,Original: BE DE FR GB IT NL SE
CA 1335424	C	EN			
DE 3853578	G	DE			Application EP 1988121789
					Based on OPI patent EP 322891
DK 171446	B	DA			Previously issued patent DK 8807254
JP 10080981	A	JA	9	0	Division of application JP 198922890
JP 2888515	B2	JA	10		Division of application JP 198922890
					Previously issued patent JP 10080981

#### **Alerting Abstract EP A**

Gas-barrier multilayered packaging materials are claimed: (1) comprising: outer layer of compsn. (I) of 55-97 wt.% ethylene-vinyl alcohol copolymer (EVOH) (ethylene content 20-50 mol%) and 45-3 wt.% (mixt.)

polyamide/polyolefin/polyester/polycarbonate resin; and inner layer of hydrophobic thermoplastic resin (II) having low moisture permeability; and (2) comprising outer layer of resin (III) having moisture permeability (40 deg.C, 90% RH) above 40 g/m<sup>2</sup>.day; intermediate layer of compsn. (I); and inner layer of resin (II) having moisture permeability below that of (III).

Also claimed are food-packages and their prodn. by filling food into (1) or (2), retorting then drying package.

Pref. inner layer, having moisture permeability below 20, pref. below 10 g/m<sup>2</sup>.day is 50 micron thick polypropylene (permeability 7g/m<sup>2</sup>.day) giving high gas-barrier prop.

Compsn. (I) comprises: EVOH having: ethylene content 27-40 mol%; saponificn. deg. of vinyl acetate component (hydrolysed during prepn. EVOH) above 99%; and melt index (190 deg.C, 2160g) 0.2-60 g/10 mins., opt. modified by 0-5 mol% copolymerisable monomer; and pref. polyamide resin, esp. caprolactam-lauryl lactam copolymer (nylon 6/12) contg. 5-60, pref. 10-50 wt.% 12-component and having relative viscosity 2-3.6, pref. 2-3.2. Opt. included are: other polymers e.g. ethylene-propylene copolymers to provide flexibility; plus conventional additives.

Resin (III) comprises principally polyester(s), polycarbonate(s) or pref. polyamide(s) esp. polycapramide and poly(hexamethylene diammonium adipate) or caprolactam/hexamethylene diammonium adipate copolymer(s).

USE/ADVANTAGE - Transparent material not whitening/wrinkling on retorting has claimed use as container-lids / pouches/cup-/tray-shaped containers for boil/retort sterilisation.

**Equivalent Alerting Abstract US A**

Gas-barrier multilayered packaging material comprises a barrier layer adapted to contact in moist environment during retort or boil sterilisation, comprising 55-97 wt.% an ethylene vinyl alcohol polymer having an ethylene content of 20-50 mol.% and 45-3 wt.% of a resin comprising e.g. polyamide resin, polyolefin, polyester resin and polycarbonate resin, and a layer of a hydrophobic thermoplastic resin having a low moisture permeability in contact with it.

USE - Useful as packaging material for boil sterilisation or retort sterilisation.

@(12pp)

**Equivalent Alerting Abstract US A**

A food package obtd. by filling a food in a multilayered packaging material comprises (a) a barrier layer adapted to contact a moist environment during retort or boil sterilisation, comprising 55-97 wt% of an ethylene vinyl alcohol polymer of ethylene content 20-50 mol% and 45-3 wt% of e.g. polyamide, polyolefin, polyester and polycarboante resin, and (b) layer of a hydrophobic thermoplastic resin having a low moisture permeability in contact with (a) in which the barrier layer is the outer layer and the thermoplastic resin is the inner layer of the multilayered packaging material. The barrier layer is adapted for direct contact with the moist environment.

USE - Useful as packaging material for use in boil sterilisation or retort sterilisation.  
@(12pp)

**Title Terms /Index Terms/Additional Words:** HIGH; GAS; IMPERMEABLE;  
MULTILAYER; PACKAGE; MATERIAL; TRANSPARENT; FOOD; CONTAINER;  
RETORT

#### **Class Codes**

International Classification (Main): B32B-027/08, B32B-027/28  
(Additional/Secondary): A23L-003/00, B29D-022/00, B32B-001/02, B32B-027/20  
, B32B-027/34, B32B-033/00, B32B-007/02, B32B-009/00, B65B-055/12,  
B65D-001/28, B65D-065/40

US Classification, Issued: 428036600, 428036700, 428412000, 428476300,  
428480000, 428483000, 428036600, 426127000, 428412000, 428476300,  
428516000

File Segment: CPI; EngPI

DWPI Class: A18; A23; A92; A94; P73; Q32; Q34

Manual Codes (CPI/A-M): A07-A04D; A07-A04E; A10-E09B; A12-P01A; A12-S06C1

#### **Chemical Indexing**

Derwent Registry Numbers: 1541-U; 5213-U; 5272-U

Plasdoc Codes (KS): 0004 0013 0016 0205 0209 0218 0231 0232 0233  
0241 0242 0248 0250 0789 0790 0836 1283 1291 1292 1319 1450  
1458 1462 1723 1804 1806 1810 2007 2008 2020 2218 2285 2331  
2332 2334 2386 2399 2421 2429 2437 2513 2514 2519 2559 2562  
2589 2595 2600 2604 2628 2654 2682 2718 2719 2726 2774 2775  
2780 2782 2790 3137 3151 3153 3155 3174 3176 3178 3234 3251  
3255 3256 3290

Polymer Fragment Codes (PF):

\*001\* 014 028 034 038 04- 040 041 046 047 050 062 063 066 067 071 141 143  
144 151 155 157 158 160 163 164 166 169 170 171 192 193 206 207 229  
231 244 245 27& 28& 289 308 310 331 341 381 387 392 393 394 396 398  
402 408 409 415 431 435 437 443 450 473 477 494 498 50- 512 514 516  
518 523 53& 532 533 535 540 541 542 55& 551 560 566 57& 575 58& 59&  
596 609 633 653 662 688 721 722 724

Derwent Chemistry Resource Numbers: (Linked) 108296-USE; 147554-USE  
(Unlinked) 108296-U; 147554-U

**Key Word Indexing**

\*1\* 108296-USE 147554-USE

**Original Publication Data by Authority**

**Australia**

Publication No. AU 198827550 A (Update 198939 E)

Publication Date: 19890629

Language: EN

Priority: JP 1987335823 A 19871229

JP 198822580 A 19880201

JP 198922890 A 19890131

**Canada**

Publication No. CA 1335424 C (Update 199525 E)

Publication Date: 19950502

Assignee: KURARAY CO LTD (KURS)

Inventor: MORITANI T

MOTOISHI Y

FUKUTOME S

ODA H

Language: EN

Application: CA 586890 A 19881222 (Local application)

Priority: JP 1987335823 A 19871229

JP 198822580 A 19880201

Original IPC: B32B-27/08(A)

Current IPC: B32B-27/08(A)

**Germany**

Publication No. DE 3853578 G (Update 199525 E)

Publication Date: 19950518

Assignee: KURARAY CO LTD (KURS)

Inventor: MORITANI T

MOTOISHI Y

FUKUTOME S

ODA H

Language: DE

Application: DE 3853578 A 19881228 (Local application)

EP 1988121789 A 19881228 (Application)

Priority: JP 1987335823 A 19871229

JP 198822580 A 19880201

Related Publication: EP 322891 A (Based on OPI patent )

Original IPC: B32B-27/08(A) B65D-65/40(B)

Current IPC: B32B-27/08(A) B65D-65/40(B)

**Denmark**

Publication No. DK 171446 B (Update 199650 E)

Publication Date: 19961104

Assignee: KURARAY CO LTD (KURS)

Inventor: MORITANI T

MOTOISHI Y

FUKUTOME S

ODA H

Language: DA

Application: DK 19887254 A 19881228 (Local application)

Priority: JP 1987335823 A 19871229

JP 198822580 A 19880201

Related Publication: DK 8807254 A (Previously issued patent)

Original IPC: B32B-27/08(A) B65D-65/40(B)

Current IPC: B32B-27/08(A) B65D-65/40(B)

Publication No. DK 198807254 A (Update 198936 E)

Publication Date: 19890630

Language: DA

Priority: JP 1987335823 A 19871229

JP 198822580 A 19880201

JP 198922890 A 19890131

**EPO**

Publication No. EP 322891 A (Update 198927 B)

Publication Date: 19890705

\*\*Mehrschichtige Verpackungsmaterialien mit guten Gassperreigenschaften

Multilayered packaging materials having high gas barrier property

Materiaux d'emballage multicouches impermeable au gaz\*\*

Assignee: KURARAY CO., LTD., 1621 Sakazu, Kurashiki-City Okayama Prefecture  
710, JP (KURS)

Inventor: Moritani, Tohei, 350-5, Ojima, Kurashiki-City, JP

Motoishi, Yasuo, 760-1, Fukushima, Kurashiki-City, JP

Fukutome, Susumu, 1-1, Mizue, Kurashiki-City, JP

Oda, Hidemasa, 1091-2, Nishibara, Nishiachi-Cho Kurashiki-City, JP

Agent: Vossius Partner, Siebertstrasse 4 P.O. Box 86 07 67, D-8000  
Muenchen 86, DE

Language: EN (17 pages, 0 drawings)

Application: EP 1988121789 A 19881228 (Local application)

Priority: JP 1987335823 A 19871229

JP 198822580 A 19880201

JP 198922890 A 19890131

Designated States: (Regional Original) BE DE FR GB IT NL SE

Original IPC: A23L-3/00 B29D-22/00 B32B-1/02 B32B-27/08 B32B-33/00  
B65B-55/12 B65D-65/40

Current IPC: A23L-3/00 B29D-22/00 B32B-1/02 B32B-27/08 B32B-33/00  
B65B-55/12 B65D-65/40

Original Abstract: This invention provides a gas-barrier multilayered packaging material which comprises an outer layer of a composition comprising 55-97 wt% of an EVOH and 45-3 wt% of a polyamide, polyolefin, polyester and/or polycarbonate and an inner layer comprising a hydrophobic thermoplastic resin having a low moisture permeability; and further provides a gas-barrier multilayered packaging material which comprises an outer layer comprising a resin layer having a moisture permeability (measured at 40(deg)C, 90% RH) of at least 40 g/m<sup>2</sup>xday, an intermediate layer of a composition comprising 55 to 97% by weight of an EVOH and 45 to 3% by weight of a polyamide, polyolefin, polyester and polycarbonate and an inner layer comprising a hydrophobic thermoplastic resin layer having a moisture permeability lower than

that of the outer layer. Both of them are useful as packaging materials to be used for boil sterilization or retort sterilization.

Claim: Gas-barrier multilayered packaging materials are claimed: (1) comprising: outer layer of compsn. (I) of 55-97 wt.% ethylene-vinyl alcohol copolymer (EVOH) (ethylene content 20-50 mol%) and 45-3 wt.% (mixt.) polyamide/polyolefin/polyester/polycarbonate resin; and inner layer of hydrophobic thermoplastic resin (II) having low moisture permeability; and (2) comprising outer layer of resin (III) having moisture permeability (40 deg.C, 90% RH) above 40 g/m<sup>2</sup>.day; intermediate layer of compsn. (I); and inner layer of resin (II) having moisture permeability below that of (III). Also claimed are food-packages and their prodn. by filling food into (1) or (2), retorting then drying package.

Pref. inner layer, having moisture permeability below 20, pref. below 10 g/m<sup>2</sup>.day is 50 micron thick polypropylene (permeability 7g/m<sup>2</sup>.day) giving high gas-barrier prop. Compsn. (I) comprises: EVOH having: ethylene content 27-40 mol%; saponificn. deg. of vinyl acetate component (hydrolysed during prep. EVOH) above 99%; and melt index (190 deg.C, 2160g) 0.2-60 g/10 mins., opt. modified by 0-5 mol% copolymerisable monomer; and pref. polyamide resin, esp. caprolactam-lauryl lactam copolymer (nylon 6/12) contg. 5-60, pref. 10-50 wt.% 12-component and having relative viscosity 2-3.6, pref. 2-3.2. Opt. included are: other polymers e.g. ethylene-propylene copolymers to provide flexibility; plus conventional additives.

Resin (III) comprises principally polyester(s), polycarbonate(s) or pref. polyamide(s) esp. polycapramide and poly(hexamethylene diammonium adipate) or caprolactam/hexamethylene diammonium adipate copolymer(s).

Publication No. EP 322891 B1 (Update 199519 E)

Publication Date: 19950412

\*\*Mehrschichtige Verpackungsmaterialien mit guten Gassperreigenschaften

Multilayered packaging materials having high gas barrier property

Materiaux d'emballage multicouches impermeable au gaz\*\*

Assignee: KURARAY CO., LTD., 1621 Sakazu, Kurashiki-City Okayama Prefecture  
710, JP (KURS)

Inventor: Moritani, Tohei, 350-5, Ojima, Kurashiki-City, JP

Motoishi, Yasuo, 760-1, Fukushima, Kurashiki-City, JP

Fukutome, Susumu, 1-1, Mizue, Kurashiki-City, JP

Oda, Hidemasa, 1091-2, Nishibara, Nishiachi-Cho Kurashiki-City, JP

Agent: VOSSIUS PARTNER, Postfach 86 07 67, D-81634 Muenchen, DE

Language: EN (20 pages, 0 drawings)

Application: EP 1988121789 A 19881228 (Local application)

Priority: JP 1987335823 A 19871229

JP 198822580 A 19880201

Designated States: (Regional Original) BE DE FR GB IT NL SE

Original IPC: B32B-27/08(A) B65D-65/40(B)

Current IPC: B32B-27/08(A) B65D-65/40(B)

Claim:

\* 1. Gassperrendes mehrschichtiges Verpackungsmaterial, das eine aeussere Schicht aus einer Masse, umfassend 55 bis 97 Gew.-% eines Ethylen/Vinylalkohol-Copolymers mit einem Ethylengehalt von 20 bis 50 Mol-%, und 45 bis 3 Gew.-% eines Polyamidharzes, Polyolefinharzes, Polyesterharzes und/oder Polycarbonatharzes und eine innere Schicht aus einem hydrophoben thermoplastischen Kunstharz mit einer Feuchtepermeabilitaet (gemessen bei 40(deg)C, 90% rel. Feuchte) von nicht mehr als 20 g/m<sup>2</sup> x Tag, umfasst.

\* 1. A gas-barrier multilayered packaging material which comprises an outer layer of a composition comprising 55 to 97 % by weight of an ethylene-vinyl alcohol copolymer having an ethylene content of 20 to 50 mol% and 45 to 3% by weight of a polyamide resin, polyolefin resin, polyester resin and/or polycarbonate resin and an inner layer of a hydrophobic thermoplastic resin having a moisture permeability (measured at 40(deg)C, 50% RH) of not higher than 20 g/m<sup>2</sup>xday.

### Japan

Publication No. JP 1253442 A (Update 198946 E)

Publication Date: 19891009

\*\*GAS BARRIER MULTILAYER PACKAGE\*\*

Assignee: KURARAY CO LTD

Inventor: MORIYA TOHEI

MOTOISHI YASUO

FUKUTOME SUSUMU

ODA HIDEAKI

Language: JA

Application: JP 1987335823 A 19871229

JP 198822580 A 19880201

JP 198922890 A 19890131 (Local application)

Original IPC: B32B-27/28

Current IPC: B32B-27/28(A)

Publication No. JP 1308626 A (Update 199005 E)

Publication Date: 19891213

\*\*MULTILAYER PACKAGE HAVING EXCELLENT GAS BARRIER PROPERTY\*\*

Assignee: KURARAY CO LTD

Inventor: MORIYA TOHEI

MOTOISHI YASUO

FUKUTOME SUSUMU

ODA HIDEAKI

Language: JA

Application: JP 1987335823 A 19871229

JP 198822580 A 19880201

JP 198922890 A 19890131 (Local application)

Original IPC: B32B-27/28 B65D-65/40

Current IPC: B32B-27/28(A) B65D-65/40

Publication No. JP 10080981 A (Update 199823 E)

Publication Date: 19980331

\*\*MULTILAYER PACKAGING BODY WITH GOOD GAS BARRIER PROPERTY\*\*

Assignee: KURARAY CO LTD (KURS)

Inventor: MORIYA TOHEI

MOTOISHI YASUO

FUKUTOME SUSUMU

ODA HIDEAKI

Language: JA (9 pages, 0 drawings)

Application: JP 198922890 A 19890131 (Division of application)

JP 1997198896 A 19890131 (Local application)

Original IPC: B65D-65/40(-) B32B-27/28(A) B32B-7/02(B) B32B-9/00(B)

B32B-27/20(B) B32B-27/34(B)

Current IPC: B65D-65/40(-) B32B-27/28(A) B32B-7/02(B) B32B-9/00(B)

B32B-27/20(B) B32B-27/34(B)

Publication No. JP 2888515 B2 (Update 199924 E)

Publication Date: 19990510

Assignee: KURARAY CO LTD (KURS)

Inventor: MORITANI T

MOTOISHI Y

FUKUTOME S

ODA H

Language: JA (10 pages)

Application: JP 198922890 A 19890131 (Division of application)

JP 1997198896 A 19890131 (Local application)

Related Publication: JP 10080981 A (Previously issued patent)

Original IPC: B65D-65/40(-) B32B-27/28(A) B32B-27/20(B) B32B-27/34(B)

Current IPC: B65D-65/40(-) B32B-27/28(A) B32B-27/20(B) B32B-27/34(B)

Publication No. JP 1993086918 B (Update 199401 E)

Publication Date: 19931214

Assignee: KURARAY CO LTD (KURS)

Language: JA (12 pages)

Application: JP 1988333785 A 19881227 (Local application)

Priority: JP 1987335823 A 19871229

Related Publication: JP 01253442 A (Based on OPI patent )

Original IPC: B32B-7/02(-) B65D-1/28(-) B32B-27/28(A)

Current IPC: B32B-7/02(-) B65D-1/28(-) B32B-27/28(A)

#### **United States**

Publication No. US 4999229 A (Update 199113 E)

Publication Date: 19910312

\*\*Multilayered packaging materials having high gas barrier property\*\*

Assignee: Kuraray Co., Ltd.

Inventor: Moritani, Tohei, JP

Fukutome, Susumu

Motoishi, Yasuo

Oda, Hidemasa

Agent: Kramer, Brufsky Cifelli

Language: EN

Application: US 1988291732 A 19881229 (Local application)

Priority: JP 1987335823 A 19871229

JP 198822580 A 19880201

JP 198922890 A 19890131

Original IPC: B29D-22/00

Current IPC: B29D-22/00(A)

Original US Class (main): 42836.6

Original US Class (secondary): 42836.7 428412 428476.3 428480 428483

Original Abstract: This invention provides a gas-barrier multilayered packaging material which comprises an outer layer of a composition comprising 55-97 wt% of an EVOH and 45-3 wt% of a resin selected from the group consisting of polyamide, polyolefin, polyester and polycarbonate and an inner layer comprising a hydrophobic thermoplastic resin having a low moisture permeability; and further provides a gas-barrier multilayered packaging material with comprises an outer layer comprising a resin layer having a moisture permeability (measured at 40(deg) C., 90% RH) of at least 40 g/m<sup>2</sup> day, an intermediate layer of a composition comprising 55 to 97% by weight of an EVOH and 45 to 3% by weight of a resin selected from the group consisting of polyamide, polyolefin, polyester and polycarbonate and an inner layer comprising a hydrophobic thermoplastic resin layer having a moisture permeability lower than that of the outer layer. Both of them are useful as packaging materials to be used for boil sterilization or retort sterilization.

Publication No. US 5069946 A (Update 199151 E)

Publication Date: 19911203

\*\*Multilayered packaging materials having high gas barrier property\*\*

Assignee: Kuraray Co., Ltd.

Inventor: Moritani, Tohei, JP

Fukutome, Susumu

Motoishi, Yasuo

Oda, Hidemasa

Agent: Kramer, Brutfsky Cifelli

Language: EN

Application: US 1990631672 A 19901221 (Local application)

Priority: JP 1987335823 A 19871229

JP 198822580 A 19880201

JP 198922890 A 19890131

Original IPC: B29D-22/00

Current IPC: B29D-22/00(A)

Original US Class (main): 42836.6

Original US Class (secondary): 426127 428412 428476.3 428516

Original Abstract: This invention provides a gas-barrier multilayered packaging material which comprises an outer layer of a composition comprising 55-97 wt% of an EVCOH and 45-3 wt% of a resin selected from the group consisting of polyamide, polyolefin, polyester and polycarbonate and an inner layer comprising a hydrophobic thermoplastic resin having a low moisture permeability; and further provides a gas-barrier multilayered packaging material which comprises an outer layer comprising a resin layer having a moisture permeability (measured at 40(deg) C., 90% RH) of at least 40 g/m<sup>2</sup> day, an intermediate layer of a composition comprising 55 to 97% by weight of an EVOH and 45 to 3% by weight of a resin selected from the group consisting of polyamide, polyolefin, polyester and polycarbonate and an inner layer comprising a hydrophobic thermoplastic resin layer having a moisture permeability lower than that of the outer layer. Both of them are useful as packaging materials to be used for boil sterilization or retort sterilization.

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